

WHAT IS CLAIMED IS:

1 1. A method of establishing bi-directional connectivity of a network
2 element in a network, the method comprising:
3 receiving a first unreliable packet from said network element;
4 storing an address of said network element in a neighbor pending list;
5 sending a reliable packet to said network element; and
6 if an acknowledgement to said reliable packet is received from said network
7 element,
8 accepting said network element as a neighbor.

1 2. The method of claim 1, wherein said unreliable packet does not require
2 a response.

1 3. The method of claim 1, wherein said reliable packet requires a
2 response.

1 4. The method of claim 1, wherein said accepting said network element
2 as neighbor is done by moving said address of said network element from said
3 neighbor pending list to a neighbor list.

1 5. The method of claim 4, further comprising:
2 if said address of said network element is in said neighbor list,
3 updating a neighbor hold count for said network element.

1 6. The method of claim 1, further comprising:
2 determining if said address of said network element is in a dampening list.

1 7. The method of claim 6, further comprising:
2 if said address of said network element is in said dampening list,
3 updating a value of a reliability count of said network element to
4 reflect higher reliability of said network element.

1 8. The method of claim 7, further comprising:
2 if said value of said reliability count is a maximum value,
3 moving said address of said network element from said dampening list
4 to said neighbor pending list.

1 9. The method of claim 8, wherein said maximum value is predetermined.

1 10. The method of claim 8, wherein said maximum value is dynamically
2 adjusted according to a traffic condition in said network.

1 11. The method of claim 6, further comprising:
2 if said network element is not in said dampening list,
3 adding said address of said network element to said dampening list,
4 and
5 setting said value of said reliability count of said network element to
6 said maximum value.

1 12. The method of claim 11, further comprising:
2 setting said neighbor hold count for said network element; and
3 sending a second unreliable packet to said network element.

1 13. The method of claim 1, further comprising:
2 initiating a neighbor pending timer.

1 14. The method of claim 12, further comprising:
2 if said acknowledgement to said reliable packet is not received before said
3 neighbor pending timer expires,
4 removing said address of said network element from said neighbor
5 pending list, and
6 updating said value of said reliability count to reflect lower reliability
7 of said network element.

1 15. The method of claim 12, further comprising:
2 if said acknowledgement to said reliable packet is received before said
3 neighbor pending timer expires,
4 moving said address of said network element from said neighbor
5 pending list to said neighbor list, and
6 removing said address of said network element from said dampening
7 list.

1 16. A system for establishing bi-directional connectivity with a network
2 element in a network comprising:
3 a central processing module; and
4 a neighbor pending list coupled to said central processing module, wherein
5 said central processing module is configured to store an address of said
6 network element in said neighbor pending list while said network
7 element is in a process of establishing said bi-directional connectivity
8 with said system.

1 17. The system of claim 16, further comprising:
2 an input-output module coupled to said central processing module, wherein
3 said input-output module is configured to provide input-output
4 interface to said central processing module; and
5 a counter module coupled to said central processing module, wherein said
6 counter module is configured to provide at least one of timing and
7 counting functionality to said central processing module.

1 18. The system of claim 16, further comprising:
2 a neighbor list coupled to said central processing module, wherein said
3 neighbor list is configured to store said address of said network
4 element after said bi-directional connectivity is established with said
5 network element; and
6 a dampening list coupled to said central processing module, wherein said
7 dampening list is configured to store said address of said network
8 element when a value of a reliability count in said counter module is
9 lower than a maximum value.

1 19. The system of claim 18, wherein said maximum value is
2 predetermined.

1 20. The system of claim 18, wherein said maximum value is dynamically
2 adjusted according to a traffic condition in said network.
3

1 21. A network device comprising:
2 a processor; and
3 a network interface coupled to said processor, said processor is configured to
4 receive a first unreliable packet from said network element,
5 store an address of said network element in a neighbor pending list,
6 send a reliable packet to said network element, and
7 if an acknowledgement to said reliable packet is received from said
8 network element,
9 accept said network element as a neighbor.

1 22. The network device of claim 21, wherein said unreliable packet does
2 not require a response.

1 23. The network device of claim 21, wherein said reliable packet requires a
2 response.

1 24. The network device of claim 21, wherein said accepting said network
2 element as neighbor is done by moving said address of said network element from
3 said neighbor pending list to a neighbor list.

1 25. The network device of claim 24, wherein said processor is further
2 configured to
3 if said address of said network element is in said neighbor list,
4 update a neighbor hold count for said network element.

1 26. The network device of claim 21, wherein said processor is further
2 configured to
3 determine if said address of said network element is in a dampening list.

1 27. The network device of claim 26, wherein said processor is further
2 configured to
3 if said address of said network element is in said dampening list,
4 update a value of a reliability count of said network element to reflect
5 higher reliability of said network element.

1 28. The network device of claim 27, wherein said processor is further
2 configured to
3 if said value of said reliability count is a maximum value,
4 move said address of said network element from said dampening list to
5 said neighbor pending list.

1 29. The network device of claim 28, wherein said maximum value is
2 predetermined.

1 30. The network device of claim 28, wherein said maximum value is
2 dynamically adjusted according to a traffic condition in said network.

1 31. The network device of claim 6, wherein said processor is further
2 configured to
3 if said network element is not in said dampening list,
4 add said address of said network element to said dampening list, and
5 set said value of said reliability count of said network element to said
6 maximum value.

1 32. The network device of claim 31, wherein said processor is further
2 configured to
3 set said neighbor hold count for said network element; and
4 send a second unreliable packet to said network element.

1 33. The network device of claim 31, further comprising:
2 initiate a neighbor pending timer.

1 34. The network device of claim 32, wherein said processor is further
2 configured to
3 if said acknowledgement to said reliable packet is not received before said
4 neighbor pending timer expires,
5 remove said address of said network element from said neighbor
6 pending list, and
7 update said value of said reliability count to reflect lower reliability of
8 said network element.

1 35. The network device of claim 32, further comprising:
2 if said acknowledgement to said reliable packet is received before said
3 neighbor pending timer expires,
4 move said address of said network element from said neighbor pending
5 list to said neighbor list, and
6 remove said address of said network element from said dampening list.

1 36. A network device comprising:
2 means for receiving a first unreliable packet from said network element;
3 means for storing an address of said network element in a neighbor pending
4 list;
5 means for sending a reliable packet to said network element; and
6 means for accepting said network element as a neighbor if an
7 acknowledgement to said reliable packet is received from said
8 network element.

1 37. The network device of claim 36, wherein said unreliable packet does
2 not require a response.

1 38. The network device of claim 36, wherein said reliable packet requires a
2 response.

1 39. The network device of claim 36, wherein said accepting said network
2 element as neighbor is done by moving said address of said network element from
3 said neighbor pending list to a neighbor list.

1 40. The network device of claim 39, further comprising:
2 means for updating a neighbor hold count for said network element if said
3 address of said network element is in said neighbor list.

1 41. The network device of claim 36, further comprising:
2 means for determining if said address of said network element is in a
3 dampening list.

1 42. The network device of claim 41, further comprising:
2 means for updating a value of a reliability count of said network element to
3 reflect higher reliability of said network element if said address of said
4 network element is in said dampening list.

1 43. The network device of claim 42, further comprising:
2 means for moving said address of said network element from said dampening
3 list to said neighbor pending list.

1 44. The network device of claim 43, wherein said maximum value is
2 predetermined.

1 45. The network device of claim 43, wherein said maximum value is
2 dynamically adjusted according to a traffic condition in said network.

1 46. The network device of claim 41, further comprising:
2 means for adding said address of said network element to said dampening list
3 if said network element is not in said dampening list, and
4 means for setting said value of said reliability count of said network element
5 to said maximum value if said network element is not in said
6 dampening list.

1 47. The network device of claim 46, further comprising:
2 means for setting said neighbor hold count for said network element; and
3 means for sending a second unreliable packet to said network element.

1 48. The network device of claim 36, further comprising:
2 initiating a neighbor pending timer.

1 49. The network device of claim 47, further comprising:
2 means for removing said address of said network element from said neighbor
3 pending list if said acknowledgement to said reliable packet is not
4 received before said neighbor pending timer expires, and
5 means for updating said value of said reliability count to reflect lower
6 reliability of said network element if said acknowledgement to said
7 reliable packet is not received before said neighbor pending timer
8 expires.

1 50. The network device of claim 47, further comprising:
2 means for moving said address of said network element from said neighbor
3 pending list to said neighbor list if said acknowledgement to said
4 reliable packet is received before said neighbor pending timer expires,
5 and
6 means for removing said address of said network element from said
7 dampening list if said acknowledgement to said reliable packet is
8 received before said neighbor pending timer expires.

1 51. A computer program product for establishing bi-directional
2 connectivity of a network element in a network, encoded in computer readable media,
3 said program product comprising a set of instructions executable on a computer
4 system, said set of instructions configured to
5 receive a first unreliable packet from said network element;
6 store an address of said network element in a neighbor pending list;
7 send a reliable packet to said network element; and
8 if an acknowledgement to said reliable packet is received from said network
9 element,
10 accept said network element as a neighbor.

11 52. The computer program product of claim 51, wherein said unreliable
12 packet does not require a response.

1 53. The computer program product of claim 51, wherein said reliable
2 packet requires a response.

1 54. The computer program product of claim 51, wherein said accepting
2 said network element as neighbor is done by moving said address of said network
3 element from said neighbor pending list to a neighbor list.

1 55. The computer program product of claim 4, wherein said set of
2 instructions is further configured to:
3 if said address of said network element is in said neighbor list,
4 update a neighbor hold count for said network element.

1 56. The computer program product of claim 51, wherein said set of
2 instructions is further configured to:
3 determine if said address of said network element is in a dampening list.

1 57. The computer program product of claim 56, wherein said set of
2 instructions is further configured to:
3 if said address of said network element is in said dampening list,
4 update a value of a reliability count of said network element to reflect
5 higher reliability of said network element.

1 58. The computer program product of claim 57, wherein said set of
2 instructions is further configured to:
3 if said value of said reliability count is a maximum value,
4 move said address of said network element from said dampening list to
5 said neighbor pending list.

1 59. The computer program product of claim 58, wherein said maximum
2 value is predetermined.

1 60. The computer program product of claim 58, wherein said maximum
2 value is dynamically adjusted according to a traffic condition in said network.

1 61. The computer program product of claim 56, wherein said set of
2 instructions is further configured to:
3 if said network element is not in said dampening list,
4 add said address of said network element to said dampening list, and
5 set said value of said reliability count of said network element to said
6 maximum value.

1 62. The computer program product of claim 61, wherein said set of
2 instructions is further configured to:
3 set said neighbor hold count for said network element; and
4 send a second unreliable packet to said network element.

1 63. The computer program product of claim 51, wherein said set of
2 instructions is further configured to:
3 initiate a neighbor pending timer.

1 64. The computer program product of claim 62, wherein said set of
2 instructions is further configured to:
3 if said acknowledgement to said reliable packet is not received before said
4 neighbor pending timer expires,
5 remove said address of said network element from said neighbor
6 pending list, and
7 update said value of said reliability count to reflect lower reliability of
8 said network element.

1 65. The computer program product of claim 62, wherein said set of
2 instructions is further configured to:
3 if said acknowledgement to said reliable packet is received before said
4 neighbor pending timer expires,
5 move said address of said network element from said neighbor pending
6 list to said neighbor list, and
7 remove said address of said network element from said dampening list.